

WHAT IS CLAIMED IS:

1. A gemstone material comprising a vitreous material in which a plurality of dichroic particles are embedded, the dichroic particles being arranged in a substantially uniform orientation.
2. The gemstone material of claim 1 wherein the substantially uniform orientation is characterized by particles having respective major surfaces oriented in a substantially common direction.
3. The gemstone material of claim 1 wherein the dichroic particles comprise flakes of dichroic film.
4. The gemstone material of claim 3 wherein the dichroic film includes at least one dielectric layer.
5. The gemstone material of claim 4 wherein the dichroic film comprises alternating layers of different dielectric films.
6. The gemstone material of claim 5 wherein the dichroic film comprises alternating layers of high and low refractive index films.
7. The gemstone material of claim 1 wherein the gemstone material is substantially free of air bubbles.
8. The gemstone material of claim 1 wherein the dichroic particles are present in a repeatable particle size distribution.
9. The gemstone material of claim 1 wherein a first predetermined portion of the dichroic particles are in a first size range and a second predetermined portion of the dichroic particles are in a second size range.

10. The gemstone material of claim 9 wherein substantially all regions of the vitreous material in which the dichroic particles are embedded have a substantially uniform ratio of dichroic particles in the first size range to dichroic particles in the second size range.
11. The gemstone material of claim 1 wherein the dichroic particles are located in one or more layers.
12. The gemstone material of claim 1 wherein the gemstone material is in the form of a slab having first and second generally-opposed major surfaces, the substantially uniform orientation being characterized by particles having their respective major surfaces oriented substantially parallel to the major surfaces of the slab.
13. The gemstone material of claim 12 wherein the dichroic particles are located in one or more layers each being substantially parallel to the major surfaces of the slab.
14. The gemstone material of claim 13 wherein each layer is located in a central thickness of the slab.
15. The gemstone material of claim 13 wherein each layer extends entirely between generally-opposed sides of the slab.
16. The gemstone material of claim 1 wherein the gemstone material is in the form of a faceted gemstone having a table, the substantially uniform orientation being characterized by particles having their respective major surfaces oriented substantially parallel to the table.
17. The gemstone material of claim 16 wherein the dichroic particles are located in one or more layers each being substantially parallel to the table of the gemstone.
18. The gemstone material of claim 17 wherein each layer extends entirely to at least one surface of the faceted gemstone.

19. The gemstone material of claim 16 wherein the dichroic particles are located in a plurality of layers of which a top layer is nearest the table, said top layer being substantially parallel to, and substantially aligned with, a girdle of the faceted gemstone.
20. The gemstone material of claim 1 wherein the gemstone material is in the form of a cabochon having a base and a dome, the substantially uniform orientation being characterized by particles having their respective major surfaces oriented substantially parallel to the to the base of the cabochon.
21. The gemstone material of claim 20 wherein the dichroic particles are located in one or more layers each being substantially parallel to the base of the cabochon.
22. The gemstone material of claim 21 wherein each layer extends entirely to at least one surface of the cabochon.
23. The gemstone material of claim 1 wherein the vitreous material comprises a glass or crystal material.
24. The gemstone material of claim 23 wherein the glass or crystal material comprises a fusible glass material.
25. A method of producing gemstone material, the method comprising:
  - a) providing a laminate comprising a plurality of dichroic particles sandwiched between two sheet-like substrates; and
  - b) heating the laminate to an elevated temperature such that the plurality of dichroic particles become fused between the sheet-like substrates.
26. The method of claim 25 wherein the laminate is maintained under a vacuum during at least a period of said heating.

27. The method of claim 26 wherein following said heating, the laminate is allowed to cool for a desired cooling period, and the laminate is exposed to substantially atmospheric pressure or super-atmospheric pressure during at least a portion of the cooling period.
28. The method of claim 25 wherein said elevated temperature is between about 600 degrees Celsius and about 850 degrees Celsius.
29. The method of claim 25 wherein the laminate is maintained under a vacuum of between about 100 torr to about 0.000001 torr. during at least a period of said heating.
30. The method of claim 29 wherein the laminate is maintained under a vacuum of between about 1 torr. and about 0.00001 torr. during at least a period of said heating.
31. The method of claim 30 wherein the laminate is maintained under a vacuum of between about 0.001 torr. and about 0.0001 torr. during at least a period of said heating.
32. The method of claim 27 wherein said heating is carried out in a vacuum chamber, and the laminate is exposed to said substantially atmospheric pressure or super-atmospheric pressure by venting the vacuum chamber to an ambient atmosphere and/or by delivering pressurized gas into the vacuum chamber.
33. The method of claim 27 wherein said substrates comprise glass or crystal sheets and said heating brings the glass or crystal sheets to a softened state, and wherein the laminate is exposed to said substantially atmospheric pressure or super-atmospheric pressure before the glass or crystal sheets cool to a hardened state.

34. The method of claim 33 wherein the laminate is exposed to said substantially atmospheric pressure or super-atmospheric pressure while the glass or crystal sheets are in the softened state.
35. The method of claim 33 wherein the laminate is exposed to said substantially atmospheric pressure or super-atmospheric pressure before the glass or crystal sheets cool to a temperature below about 600 degrees Celsius.
36. The method of claim 35 wherein the laminate is exposed to said substantially atmospheric pressure or super-atmospheric pressure while the glass or crystal sheets are at a temperature between about 600 degrees Celsius and about 850 degrees Celsius.
37. The method of claim 25 wherein the providing of the laminate comprises positioning the plurality of dichroic particles between the two sheet-like substrates.
38. The method of claim 25 wherein the plurality of dichroic particles comprises crushed dichroic particles, and the providing of the laminate comprises: providing crushed dichroic particles; and positioning a plurality of the crushed dichroic particles between the two sheet-like substrates.
39. The method of claim 38 wherein the providing of the crushed dichroic particles comprises: providing a glass or crystal sheet bearing a dichroic coating; and crushing the thus-coated glass or crystal sheet.
40. The method of claim 39 wherein the providing of the glass or crystal sheet bearing a dichroic coating comprises depositing the dichroic coating upon the glass or crystal sheet.

41. The method of claim 38 wherein the crushed dichroic particles are separated into different groups characterized by different particle size ranges, whereafter at least some particles from different groups are combined in a desired particle size distribution to form said plurality of the crushed dichroic particles.
42. The method of claim 41 wherein the crushed dichroic particles are separated into different groups by moving the crushed dichroic particles through one or more sieves.
43. The method of claim 25 further comprising arranging the plurality of dichroic particles in a substantially uniform orientation.
44. The method of claim 43 wherein the plurality of dichroic particles are arranged in a substantially uniform orientation by imparting shear upon the laminate.
45. The method of claim 44 wherein the shear is imparted upon the laminate during said heating and/or during a subsequent cooling period.
46. The method of claim 44 wherein the shear is imparted upon the laminate while the laminate is at a temperature of between about 600 degrees Celsius and about 850 degrees Celsius.
47. The method of claim 43 wherein the laminate is rotated to arrange the plurality of dichroic particles in a substantially uniform orientation.
48. The method of claim 47 wherein the laminate is rotated by placing the laminate on a spinner and spinning the spinner.
49. A method of producing gemstone material, the method comprising:
- a) providing two sheet-like substrates;
  - b) providing a plurality of dichroic particles;
  - c) separating at least some of the dichroic particles into different groups

characterized by different particle size ranges;

- d) combining at least some particles from the different groups in a desired particle size distribution to produce size-classified particles;
- e) positioning a plurality of the size-classified particles between the two sheet-like substrates to form a laminate; and
- f) heating the laminate to an elevated temperature such that said plurality of the size-classified particles become fused between the sheet-like substrates.

50. The method of claim 49 wherein said heating brings the laminate to a softened state, the method comprising arranging the plurality of dichroic particles in a substantially uniform orientation by imparting shear upon the laminate while the laminate is in the softened state.

51. The method of claim 49 wherein the laminate is maintained under a vacuum during at least a period of said heating.

52. The method of claim 51 wherein following said heating, the laminate is allowed to cool for a desired cooling period, and the laminate is exposed to substantially atmospheric pressure or super-atmospheric pressure during at least a portion of the cooling period.

53. The method of claim 49 wherein said heating brings the laminate to a softened state, the method comprising arranging the plurality of dichroic particles in a substantially uniform orientation by imparting shear upon the laminate while the laminate is in the softened state, and wherein following said heating, the laminate is allowed to cool for a desired cooling period, and the laminate is exposed to substantially

atmospheric pressure or super-atmospheric pressure during at least a portion of the cooling period.

54. A gemstone material comprising a vitreous material in which a plurality of dichroic particles are embedded, the gemstone material being substantially free of air bubbles.

55. The gemstone material of claim 54 wherein the dichroic particles are present in a repeatable particle size distribution.

56. The gemstone material of claim 55 wherein the dichroic particles are arranged in a substantially uniform orientation.

57. A gemstone material comprising a vitreous material in which a plurality of dichroic particles are embedded, wherein the embedded dichroic particles are present in a repeatable particle size distribution.